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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/869,410	08/31/2001	Pieter Lykle Buwalda	294-103PCT/U	2611

7590 02/08/2005  
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EXAMINER

LEWIS, PATRICK T

ART UNIT	PAPER NUMBER
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1623

DATE MAILED: 02/08/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

**Application No.**

09/869,410

**Applicant(s)**

BUWALDA ET AL.

**Examiner**

Patrick T. Lewis

**Art Unit**

1623

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 12 November 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 35-45 is/are pending in the application.
- 4a) Of the above claim(s) 35-41 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 42-45 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

### ***Applicant's Response Dated November 12, 2004***

1. In the Response filed November 12, 2004, claims 21-34 were canceled; and claims 35-45 were added. Claims 35-45 are pending. An action on the merits of claims 35-45 is contained herein below.

2. Newly submitted claims 35-41 are directed to an invention that is independent or distinct from the invention originally claimed for the following reasons: newly added independent claim 35 is drawn to a method for preparing a reversible gel. The instant method is drawn to a different effect (preparation of a hydrophobic starch vs. preparation of a reversible gel).

Since applicant has received an action on the merits for the originally presented invention, this invention has been constructively elected by original presentation for prosecution on the merits. Accordingly, claims 35-41 are withdrawn from consideration as being directed to a non-elected invention. See 37 CFR 1.142(b) and MPEP § 821.03.

3. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on August 16, 2004 has been entered.

4. The rejection of claims 21-26 under 35 U.S.C. 103(a) as being unpatentable over Seppala et al WO 97/03120 (Seppala) in view of Hovenkamp-Hermelink et al. Theor. Appl. Genetics (1987), Vol. 75, pages 217-221 (Hovemkamp) and Bathelaan et al. WO 94/24169 (Bathelaan) has been rendered moot in view of applicant's amendment dated November 12, 2004.

5. The rejection of claim 27 under 35 U.S.C. 103(a) as being unpatentable over Seppala et al WO 97/03120 (Seppala) in view of Hovenkamp-Hermelink et al. Theor. Appl. Genetics (1987), Vol. 75, pages 217-221 (Hovemkamp) has been rendered moot in view of applicant's amendment dated November 12, 2004.

6. The rejection of claim 28 under 35 U.S.C. 103(a) as being unpatentable over Seppala et al WO 97/03120 (Seppala) in view of Hovenkamp-Hermelink et al. Theor. Appl. Genetics (1987), Vol. 75, pages 217-221 (Hovemkamp) and Bathelaan et al. WO 94/24169 (Bathelaan) has been rendered moot in view of applicant's amendment dated November 12, 2004.

7. The rejection of claims 29-34 under 35 U.S.C. 103(a) as being unpatentable over Seppala et al WO 97/03120 (Seppala); Hovenkamp-Hermelink et al. Theor. Appl. Genetics (1987), Vol. 75, pages 217-221 (Hovemkamp) and Bathelaan et al. WO 94/24169 (Bathelaan) further in view of Lachocki US 5,563,251 (Lachocki) has been rendered moot in view of applicant's amendment dated November 12, 2004.

***Claim Rejections - 35 USC § 112***

8. The following is a quotation of the second paragraph of 35 U.S.C. 112:

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The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

9. Claims 42-45 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Said claims are drawn to a method which comprises attaching a hydrophobic substituent to a starch by a reaction selected from the group consisting of etherification and esterification; however, wherein the reactive group is "glycidyl or quaternary ammonium", neither etherification nor esterification occurs.

10. Claims 43-44 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The phrase "wherein the reactive group...or mixtures thereof" renders said claims indefinite. There is insufficient antecedent basis for this limitation in the claims, as independent claim 42 does not recite "mixtures".

### ***Claim Rejections - 35 USC § 103***

11. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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12. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

13. Claims 42-45 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Seppala et al. WO 97/03120 (Seppala) and Hovenkamp-Hermelink et al. Theor. Appl. Genetics (1987), Vol. 75, pages 217-221 (Hovenkamp) further in view of Bathelaan et al. WO 94/24169 (Bathelaan); Lachocki US 5,563,251 (Lachocki) and Harris et al. US 5,977,348 (Harris).

Claims 42-45 are drawn to a process for increasing the associative behavior of a starch comprising attaching a hydrophobic substituent to the starch by esterification or etherification wherein the starch is a root or tuber starch, or derivative thereof wherein said starch is from a plant that has been genetically modified to have reduced amylose content, comprising at least 95% amylopectin based on the dry substance of the starch and wherein the reaction utilizes a hydrophobic reagent comprising an alkyl having 7-24 carbon atoms.

Seppala teaches hydrophobic starches which may be derived from potato, wheat, maize, tapioca, rice and similar root or cereal plants (page 15, lines 18-26). The amylopectin content of the starch may be from 0 to 100% (page 15, lines 18-20). The starch is prepared by oxidation, hydrolysatation, cross-linking, cationization, etherification,

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or esterification. The starches are preferably obtained from the esterification or etherification of the natural starch with one or several C2-24-carboxylic acids (page 15, lines 28-31; page 16, lines 1-4). Esterification is also accomplished using acetic anhydride in the presence of a catalyst (page 16, lines 15-22).

Seppala and the instantly claimed invention differ in that Seppala does not teach (1) starches from a plant that has been genetically modified, (2) a process wherein the starch is hydrophobized by a reagent having a reactive group recited in dependent claims 43-44, and (3) attaching the hydrophobic group in the presence of a surfactant.

Hovenkamp teaches the isolation of amylase-free starch from mutant potatoes (page 22, first paragraph). The amylase-free variant of potato is characterized by the absence of GBSS.

Bathelaan teaches a method of making polysaccharides via amidation utilizing long chain amid-modified carboxyl-containing primary alkyl amines (pages 12-14, Examples 1-3). Bathelaan also teaches the use of butyl glycol ether [surfactant] to aid in the hydrophobization (page 11, lines 4-7).

Lachocki teaches a process for reacting hydrophilic polyols with hydrophobic epoxy compounds (column 2, lines 14-55). Non-limiting examples of such hydrophobic compounds include alpha-olefin epoxy compounds such as hexylene oxide, heptylene oxide, octylene oxide, etc. or glycidyl ethers, such as phenyl glycidyl ether, octyl glycidyl ether, decyl glycidyl ether, epoxides of unsaturated fats, oils, fatty acids, salts or fatty esters, internal-olefin epoxides, cyclododecyl epoxide, etc., branched internal-olefin epoxides, etc. Quaternary substituted epoxides can also be used.

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Harris teaches conventional modifications of starches (i.e. esterification and etherification) (column 5, lines 40-57; columns 6-8). The derivatizing agents which may be used include any type of organic etherifying or esterifying reagent which is known to react with starch such as ethylene oxide, propylene oxide, butylene oxide, allyl chloride, dialkylaminoethylchloride, or 1-chloro-2-hydroxypropyl trimethylammonium chloride.

The methodological steps claimed by applicant for preparing a hydrophobic starch are well known in the art. It would have been obvious to one of ordinary skill in the art at the time of the invention to react starch with a hydrophobic reagent comprising a reactive group wherein the reactive group is a halide, halohydrin, epoxide, glycidyl or quaternary ammonium. The selection of an appropriate hydrophobic reagent or starch in a conventional process is seen to be well within the purview of one of ordinary skill in the art at the time of the invention. A prima facie case of obviousness may be made when chemical compounds have very close structural similarities and similar utilities. An obviousness rejection based on similarity in chemical structure and function entails the motivation of one skilled in the art to make a claimed compound, in the expectation that compounds similar in structure will have similar properties.

It would have also been obvious to one of ordinary skill in the art at the time of the invention to use a surfactant in the reaction between the starch and hydrophobic reagent. One of the most common uses of surfactants is to aid reactions involving hydrophobic and hydrophilic compounds.



**Conclusion**

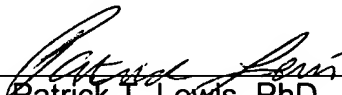
14. Claims 35-45 are pending. Claims 35-41 are drawn to a nonelected invention. Claims 42-45 are rejected. No claims are allowed.

**Contacts**

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Patrick T. Lewis whose telephone number is 571-272-0655. The examiner can normally be reached on Monday - Friday 10 am to 3 pm (Maxi Flex).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, James O. Wilson can be reached on 571-272-0661. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

  
Patrick T. Lewis, PhD  
Examiner  
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